

## STORMS AND WEATHER WARNINGS

## WASHINGTON FORECAST DISTRICT

The only storm warnings of the month were displayed from Delaware Breakwater to Eastport, Me., at 10 p. m. of the 24th in connection with a disturbance of considerable intensity that moved eastward over the southern Lake region. The highest wind velocities reported were 36 miles an hour from the northeast at Eastport and 48 miles from the northwest at New York City.

Small-craft warnings were displayed from Delaware Breakwater to Boston on the 16th; from Sandy Hook to Eastport on the 18th; and from Delaware Breakwater to Block Island, R. I., on the 25th.

Except for warnings of light frost in the cranberry bogs of New Jersey on the 11th, no frost warnings were issued during the month.—*C. L. Mitchell.*

## CHICAGO FORECAST DISTRICT

*Storm warnings.*—No storms of major character occurred on the Great Lakes during the month, but there were several disturbances of more or less minor force that were attended by winds that just reached or slightly exceeded (for short periods as a rule) the velocities considered as of storm strength. Most of the disturbances referred to affected only the upper Lakes. In the majority of cases the conditions were covered by small-craft warnings, but in a few instances storm warnings were issued.

On the afternoon of the 9th winds of just about verifying force were attained over virtually all the upper Lakes section in connection with a disturbance that had moved from the southeastern slope of the Rocky Mountains to the Red River of the North Valley, whence a path was taken that carried the center north of Lake Superior on the date in question. Southwest storm warnings had been issued on the afternoon of the preceding date for most of the upper Lake districts, but the warnings were taken down the same night when it appeared that the disturbance was losing energy. A redevelopment took place that night, however, and small-craft warnings were advised on the morning of the 9th for the upper Lakes.

On the night of the 11th northeast warnings were issued for Lake Superior, and southeast warnings for Lake Michigan. At that time a trough of low pressure of some depth covered the Plains area, while at the same time a marked high pressure area overlay the Northeast. On the morning of the 12th southwest warnings were issued for Lake Huron. All warnings were justified, since verifying velocities occurred along the west shore of Lake Michigan, and near verifying velocities elsewhere.

The final disturbed period of the month covered the 24–26. On the date first mentioned a moderate barometric depression moved from the Middle West to the lower Lake region, increasing in energy as it progressed; while a second disturbance moved southeastward from the Northwest on the 25th in rapid succession, it likewise increasing in force as it advanced. The wind attained the strength of a moderate storm over most of Lake Superior, but elsewhere no verifying velocities were reached. Messages either of an advisory character or small craft warnings were issued in this connection.

*Frost warnings.*—A few frost warnings were issued, but these were in most cases for districts of little agricultural importance, and consequently the warnings were of little economic value. The warnings in question were those of the 10th and 27th for northern Michigan; and on the 13th, for northwestern Wyoming; and from the 26th to the 29th, for either all or portions of the Wis-

consin cranberry section. Some frost occurred in the bogs on two or three nights within the period mentioned, but no damage resulted.

*Fire-weather forecasts.*—Those to the State Forester at St. Paul, Minn., were discontinued temporarily, on the 10th, at which time the critical conditions in the Minnesota area had passed. Upon request by the Forester the forecasts will be continued during the next fire period.—*C. A. Donnel.*

## NEW ORLEANS FORECAST DISTRICT

The prevailing movement of barometric depressions that formed in the Southwest was toward the extreme north-central portion of the country and no well-defined disturbance passed across the west Gulf district. Conditions were mostly favorable for local showers along the coast and much hot, dry weather in the interior.

No storm warnings were issued or needed. Small-craft warnings were displayed on the east coast of Texas on the 12th and were justified.—*R. A. Dyke.*

## DENVER FORECAST DISTRICT

The persistent high barometric pressure that characterized the month in the Eastern and Southern States was accompanied by the development of an unusually large number of low-pressure areas over the western half of the country, especially in Colorado and New Mexico. Only three of these southwestern lows attained sufficient energy to pass eastward out of the district, and two of them progressed no farther than the Missouri Valley. The presence of so many lows, fluctuating both in intensity and position, was reflected in the remarkably unstable temperature conditions for which the month was notable in this district.

While generally unsettled conditions prevailed, with local showers somewhere in the district nearly every day, the only period of general precipitation was from the 19th to 21st, when showers occurred over most of Colorado, New Mexico, southern Utah, and eastern Arizona.

Because of active lows in Arizona or eastern New Mexico, fire-weather warnings for the forests of Arizona, New Mexico, and southern Utah were issued on the 3d, 5th, 6th, and 17th, all of which, except the last, were followed by wind velocities sufficiently high over the regions specified to render the fire hazard very great.—*E. B. Gittings, jr.*

## SAN FRANCISCO FORECAST DISTRICT

The weather in this district during the month of June was marked by two entirely different types. During the first part of the month the barometric pressure, with but little interruption, remained low over the North Pacific States and northern Plateau region, while the Pacific Ocean HIGH was central between the California coast and Hawaiian Islands. This distribution of pressure caused generally cloudy and cool weather with frequent rains in the western portions of Washington and Oregon, the northern Plateau region, and the extreme northern portion of California, and cool weather with considerable cloudiness in other portions of the district.

This condition greatly delayed the maturing of both grain and fruit crops in California, and at times caused considerable anxiety concerning the probable yield of each. On the 3d, 4th, and 10th frosts occurred in the northern Plateau region.

During the latter part of the second decade there was a marked change in the pressure distribution. The Pacific Ocean HIGH moved farther north and a portion

moved inland over the North Pacific States, western Canada, and the northern Rocky Mountain region, and covered those sections during the remainder of the month.

This distribution of pressure caused clear and decidedly warmer weather over the entire district with light dry northerly winds and very low humidity, and developed into a "hot wave" of marked intensity, especially over the northern and central portions of this district. Temperatures equal to or exceeding all previous records for June were reported at a number of stations, and the highest temperature ever recorded occurred at North Head, Seattle, Tacoma, Marshfield, and Sacramento. In this connection it is well to note that the record broken at Sacramento covers a period of 47 years. At the breaking of the "hot wave" numerous thunderstorms occurred in the Plateau region, the Sierra Nevada and mountain regions of southern California.

Fire-weather warnings were issued in California on the 13th, and over the entire district on the 23d, and supplementary advices continued daily until the 28th. These warnings were timely and highly appreciated by interested parties.—*G. H. Willson.*

### RIVERS AND FLOODS

By H. C. FRANKENFIELD

As will be noted in the table following this report, no floods of consequence—except that continuing in the drainage area of the Columbia River—occurred in the important rivers of the country during June, 1925. The scattered rises in Nebraska, Kansas, Missouri, and Texas were due largely to heavy local rains and were attended by no important loss except that of one highway bridge and 2,000 head of cattle along the Nueces River of Texas; the high stages in the lower Rio Grande occurred as part of the great flood reported upon in the May number of this REVIEW; and the Colorado, while still above flood stage at Parker, Ariz., at the close of the month, had caused no flood damage.

There were, however, as results of so-called cloudbursts, a few destructive floods in scattered smaller streams. Of these the most costly occurred in the Delaware River and Big Stranger and Soldier Creeks of northeastern Kansas, where two boys were drowned, and estimated property losses totaling \$1,792,000, exclusive of that to railroads, occurred as follows: Tangible property, \$167,000; prospective crops, \$1,590,000; livestock and movable property, \$20,000; and suspension of business, \$15,000.

Of somewhat similar conditions in Iowa the official in charge of the Weather Bureau office at Dubuque reports as follows:

A series of four heavy rainstorms visited northeastern Iowa from June 11 to 24, resulting in floods which took a toll of 10 lives and cost in damage to property, including livestock, prospective crops, highways and bridges, railway trackage and bridges, and town properties, a total of approximately \$1,888,000.

In this case the greatest single item of loss was \$490,000 in prospective crops, with damage to highway bridges and fills and to railroads each closely approaching that figure. The major part of the damage occurred along the Maquoketa River, where the three hardest-hit communities—Manchester, Dyersville, and Cascade—suffered losses totaling \$450,000.

Another flood of similar character but less destructiveness occurred on the Zumbro River of Minnesota. Newspapers report two casualties in this flood, and losses at from \$100,000 to \$500,000.

As a result of the rainfall shortage in the upper Mississippi Valley during the spring of 1925, which was in many localities the driest spring of record, the Mississippi River fell lower at virtually every gaging station from the headwaters to St. Louis, Mo., than in any previous May or June of record. Below St. Louis the river was generally lower than in any June since 1895. The following table gives comparative stages for the months of May and June:

*Low water in May and June on Mississippi River. Previous records compared with 1925*

	Low water record for month of May		Low water record for month of June	
	Previous record	1925 record	Previous record	1925 record
Fort Ripley, Minn.	3.4, 1924	3.4	3.3, 1924	3.3
St. Paul, Minn.	0.0, 1924	-0.5	-0.4, 1924	-0.6
Red Wing, Minn.	0.7, 1911	0.3	0.3, 1910	0.2
Reads, Minn.	0.4, 1911	0.6	0.2, 1900 and 1910	0.5
Winona, Minn.	3.6, 1921 and 1924	0.8	1.6, 1924	0.8
La Crosse, Wis.	1.8, 1879	0.9	1.3, 1910	0.9
Lansing, Iowa	4.7, 1923	2.1	2.9, 1923	2.1
Prairie du Chien, Wis.	2.0, 1895	2.0	1.3, 1900	1.8
Dubuque, Iowa	2.0, 1879	2.0	1.4, 1900	1.9
Clinton, Iowa	2.9, 1911	2.5	2.1, 1910	2.4
Le Claire, Iowa	1.2, 1895 and 1902	1.3	0.7, 1900	1.2
Davenport, Iowa	1.4, 1895	1.3	1.4, 1900	1.2
Muscatine, Iowa	1.3, 1895	1.9	2.1, 1910	1.9
Keokuk, Iowa	1.0, 1902	0.3	1.1, 1900	0.3
Warsaw, Ill.	2.8, 1895	2.5	3.5, 1887	2.6
Quincy, Ill.	3.0, 1911	1.1	2.6, 1910	1.2
Hannibal, Mo.	2.1, 1902	1.6	2.4, 1895 and 1900	1.5
Louisiana, Mo.	2.1, 1895	1.8	2.2, 1895	1.6
Grafton, Ill.	3.9, 1895	4.1	3.7, 1895	3.7
Alton, Ill.	7.8, 1918	4.9	8.7, 1891 and 1923	5.0
St. Louis, Mo.	5.6, 1895 and 1911	5.6	7.1, 1895	6.0
Chester, Ill.	3.2, 1895	6.4	4.4, 1895	6.5
Cape Girardeau, Mo.	9.4, 1911	9.6	9.8, 1911	9.5
Caro, Ill.	13.6, 1895 and 1911	14.2	9.8, 1895	12.8
New Madrid, Mo.	11.9, 1911	9.8	10.0, 1911	8.0
Memphis, Tenn.	7.0, 1895	10.2	4.4, 1895	6.6
Helena, Ark.	11.0, 1895	14.1	8.1, 1895	8.4
Arkansas City, Ark.	12.4, 1895	18.6	8.0, 1895	9.4
Greenville, Miss.	9.8, 1895	13.1	7.3, 1895	7.0
Vicksburg, Miss.	10.2, 1895	17.3	6.7, 1895	10.6
Natchez, Miss.	21.0, 1915	16.9	10.2, 1911	10.1
Baton Rouge, La.	17.2, 1915	8.8	5.5, 1911	4.8
Donaldsonville, La.	12.5, 1915	6.0	3.6, 1911	3.5
New Orleans, La.	1.2, 1895	2.3	1.0, 1895	1.5

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI DRAINAGE					
	<i>Feet</i>			<i>Feet</i>	
Sulphur: Ringo Crossing, Tex. ....	20	9	11	25.0	9
Kansas: Bonner Springs, Kans. ....	18	19	21	18.3	19
Big Blue:					
Beatrice, Nebr. ....	16	17	17	16.9	17
Blue Rapids, Kans. ....	20	18	18	20.6	18
Grand:					
Gallatin, Mo. ....	20	4	5	20.8	4
Chillicothe, Mo. ....	18	4	6	24.1	6
		17	17	18.3	17
Brunswick, Mo. ....	10	5	8	11.9	7
		14	22	12.4	19
		29	30	10.4	30
WEST GULF DRAINAGE					
Nueces: Cotulla, Tex. ....	15	3	7	18.0	5
Rio Grande:					
Rio Grande City, Tex. ....	15	(1)	3	24.5	2
Mission, Tex. ....	24	3	5	24.5	3
San Benito, Tex. ....	21	1	6	24.4	5
COLORADO DRAINAGE					
Colorado:					
Lees Ferry, Ariz. ....	12	(1)	10	13.5	3
		20	30	13.4	25
Parker, Ariz. ....	7	(1)	14	8.2	May 31
		24	(2)	7.6	June 28-30
PACIFIC DRAINAGE					
Columbia:					
Marcus, Wash. ....	24	(1)	(2)	30.4	May 28
Wenatchee, Wash. ....	40	(1)	(3)	40.8	May 28
Vancouver, Wash. ....	15	(1)	17	21.5	May 25-28
		22	30	15.6	June 25-28
Pond Oreille: Newport, Wash. ....	16	(1)	14	19.9	May 31 to June 2
Willamette: Portland, Oreg. ....	15	(1)	(2)	21.7	May 28

<sup>1</sup> Continued from last month.

<sup>2</sup> Continued at end of month.

<sup>3</sup> Below flood stage at 8 a. m., June 1, 1925.